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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Agnes Bauk

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PATENT DEPARTMENT
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EXAMINER

NGUYEN, COLETTE B

ART UNIT

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1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,506	Applicant(s) BAUK ET AL.	
	Examiner COLETTE NGUYEN	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Status of the application

Claim 1, 11, 12, and 16-21 are amended. The specification also amended. Claims 1-23 are presented for examination

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 to 9 are rejected under 35 U.S.C. 103(a) as obvious over Nakasugi et al (4,138,278). Nakasugi teaches a method for producing a steel sheet having excellent low-temperature toughness with compositions that encompass the instant claims with the following disclosures:

C: 0.01-0.13% vs. 0.08 to 0.25% (Col6,ln40-59)

Si: 0.05-0.8% vs. 0.1 to 0.30% (Col6, ln41-66)

Mn: 0.8-1.8% vs. 0.8 to 1.6% (Col6, ln67-Col7,ln 1-10)

P: less than 0.03% vs. 0.020% (Col7, ln35-40)

S: 0.015% vs. 0.015% (Col6, ln44)

Cr: 0.6% vs. 0.40 to 0.80% (Col8,ln12-16)

Mo: 0.08-0.4% vs. 0.30 to 0.50% (Col6,ln45)

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Ni: less than 2.5% vs. 0.7 to 1.2% (Col8, ln 17-25)

Al: 0.01-0.08% vs. 0.020 to 0.060% (Col 7, ln11-20)

N: 0.001-0.009% vs. 0.007 to 0.018% (Col10, ln6)

V: not more than 0.20% vs. 0.% (col6,ln 40-45 and table 2)

Nb: 0.0005-0.05% vs.0.02-0.07 (table 2)

with the remainder being iron and inevitable impurities. These ranges overlap with the instant claims and are considered anticipatory. (col. 2,3,6 and table 2,3).

As Nakasugi 's teaching relates to a steel sheet composition used mainly for pipe, wherein the thickness requirement is significantly more than a steel sheet used for fittings or valves, or flanges, etc... And vanadium is added for the purpose of increasing the steel sheet thickness. Therefore the key elements of Nakasugi's teaching do not have vanadium. (Col6, ln 38- 45 and Col7, ln 46-68, Col8,1-4)

While Nakasugi does not give a specific example of a steel falling within the claimed ranges, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Regarding claim 9, as shown in Figure 1, the grain sizes fall below grains of ASTM 9.

2. **Claims 9-20, and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakasugi et al as applied to claim1 above, and further in view of Heitmann et al. (5,282,906).

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Nakasugi discloses method for producing a steel sheet having remarkable toughness at low temperature with compositions of all major components encompassing the instant claims. However, he does not teach to use the disclosed steel to make steel bar. Heitmann et al, on the other hand discloses a method to make hot rolled steel bar with relatively high hardness, high strength and high toughness to make springs using in automotive industry.

It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Nakasugi of steel composition of high toughness at low temperature with the teaching of Heitmann of steel bar process to manufacture steel products with high toughness at low temperature as the demand of these products is increasing and there are better financial profits than regular steel.

3. Regarding claim 9. Nakasugi in view of Heitmann teach a steel according to claim 1, wherein it has an austenite grain size that is finer than ASTM 10. (Heitmann, Col1, ln,60, *"Improved toughness is also attributable to a relatively fine austenitic grain size(e.g. finer than ASTM10).*

4. Regarding claim 10. Nakasugi in view of Heitmann disclose a steel composition according to claim 1 for the production of high-strength components by cold forming with subsequent temper-hardening. (Heitmann,Col.4, ln 14, *" The setting procedure is a conventional procedure in which the spring is compressed at ambient temperature..", i.e. ambient temperature is "cold forming"). And "shot peening is a conventional manufacturing process after quenching and tempering".*

5. Regarding claims 11,12,13,14,15. Nakasugi in view of Heitmann teach the use of these steel according as claim 10 wherein the components are means for the

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carrying, pulling, lifting, conveying or securing of loads, means for the connections of structural elements, chains which are round and welded. Nakasugi discloses a use of the steel as fittings and pipes and also for general applications requiring low-temperature toughness other than the pipes (Col.1, ln.18, and Col 10, ln 20) and Heitmann discloses the use as a spring.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the steel of Nakasugi as worked by Heitmann for making any desirable product which would benefit from the improved characteristics as taught by Nakasugi, such as fracture toughness (col. 1, lines 23-27).

6. Regarding claims 16,17,18. Nakasugi in view of Heitmann disclose the yield strength and tensile strength within the claimed ranges (Heitmann, col.3, ln 42).
7. Regarding claim 19. Nakasugi in view of Heitmann disclose an use according to claim 10, wherein at a strength of at least 1,550 MPa, the fracture appearance transition temperature FATT of the components is at least -60C.(Nakasugi, table 1 and Heitmann, Col.3, ln.43).
8. Regarding claim 20. Nakasugi in view of Heitmann disclose a use according to claim 10, wherein the notch impact working value is more than 45J. (Nakasugi Tablei, properties of base metal). Notch impact is the same as Charpy impact, and 45J is equivalent to 4.6 kg-m.
9. Regarding claim 23. Nakasugi in view of Heitmann disclose a use according to claim 10, wherein the components exhibit an elongation at break of more than 28%. (Nakasugi, table 1, elongation 36-42%)

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10. Regarding claims 21 and 22, while Nakasugi and Heitmann do not disclose a specific crack initiation toughness, as the composition of the steel as taught by Nakasugi, and the strength, notch impact, and elongation characteristics are similar, it is expected that the crack initiation toughness would also be commensurate.

11. **Claims 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakasugi and Heitmann et al. (5,282,906) as applied to claim 10 and further in view of Xiao Chen et al in ("The properties of high toughness low-temperature -70C steel 09mnNiDR". National Enterprise Technology Centre of Wuhan Iron and Steel Co.) Both Nakasugi and Heitmann do not specifically teach the J_{ic} (technical crack initiation toughness) of steel, a measurement and testing parameter, despite the teaching of the steel compositions encompass the instant claims. Xiao Chen teaches similar steel composition with application in petroleum and chemical equipment at low temperature at -70C. It would have been obvious for one of ordinary skill in the art at the time of the invention to form the steel product of Nakasugi as modified by Heitmann as Chen teaches these characteristics are beneficial to the steel sheet.

12. Regarding claims 21 and 22, Xiao Chen teaches a J_{ic} of 332 (kJ/m²) which is higher than 170 N/mm² or 185 N/mm² as claimed.(Xiao, table 9)

Response to Arguments

1. Applicant's arguments filed 04/08/09 have been fully considered:
2. In regards of the rejection based on 112. The examiner withdraws as clarification and correction are convincing. In regards of the rejections based on 103 as in the first

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action, they are maintained as the arguments are not persuasive. The fact that the applicant changes "=" to "≤" do not change the claim ranges as the examiner interprets as the same. In regards of the argument of V and Nb contents, Nagasaki clearly points out in Col 3, ln 45-55 , V and Nb contents can be modified depended on the content of Mo and vanadium is added only for the purpose of increasing the thickness of the steel sheet (Col 7, ln 46-66). And from table 2, some of steel sheets do not have vanadium It would have been obvious for one of ordinary skill in the art at the time of the invention to keep vanadium content to a minimal amount or not at all same as Nagasaki 's teaching and keep the contents of Nb and Mo accordingly as Nagasaki already discloses the alternatives.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLETTE NGUYEN/
Examiner, Art Unit 1793

June 22, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793